REMARKS

This communication responds to the Office Action dated December 9, 2008.

Claims 1, 10-12, 20, and 21 are amended, and no further claims are canceled or added by this communication; as a result, claims 1-21 are pending in this application.

§ 101 Rejection of the Claims

Claims 1-10 and 12-20 were rejected under 35 U.S.C. § 101 as not falling within one of the four statutory categories of invention. Claims 1 and 12 were amended to better recite the subject matter. Applicant respectfully submits that the subject matter of claims 1-10 and 12-20 is patentable under § 101.

The Federal Circuit has stated in *In re Bilski* that a claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.[1] Thus, the claimed subject matter is patent eligible if it satisfies either prong of the test. The subject matter in claims 1-10 and 12-20 is patent eligible because it in fact satisfies both prongs of the test enunciated in *Bilski*.

Base claims 1 and 12 presently recite "accessing, using a computing device, stored volumetric (3D) imaging data of a subject." Therefore, claims 1 and 12 are tied to an apparatus and the claims satisfy the first prong of the test.

Claim 1 also recites "obtaining segmented 3D tubular structure data by performing a segmentation that separates the 3D tubular structure data from other data in the 3D imaging data" and claim 12 recites "iteratively performing a segmentation to separate 3D tubular structure data from other data in the 3D imaging data." Thus, the 3D tubular structure data is segmented, and the subject matter of the claims transforms a particular article (the data) into a different state (segmented data). Therefore, these claims satisfy the second prong of the test.

Accordingly, Applicant respectfully submits that claims 1-10 and 12-20 are directed toward statutory subject matter, and Applicant respectfully requests withdrawal of the rejection and allowance of claims 1-10 and 12-20.

---

[1] In re Bilski, 545 F.3d 943 (Fed. Cir. 2008).

§ 112 Rejection of the Claims

Claims 10 and 20 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 10 and 20 were amended to better recite the subject matter. Support for the amendment can be found on page 20 lines 16-20. Applicant respectfully submits that claims 10 and 20 are clear when the Specification of the present Application is read by one of ordinary skill in the art in view of the incorporated U.S. Patent Application Serial No. 10/679,250.

Applicant respectfully requests withdrawal of the rejection and allowance of claims 10 and 20.

§ 103 Rejection of the Claims

Claims 1-21 were rejected under 35 U.S.C. § 103(a) as being obvious over Johnson et al. (U.S. Patent No. 6,928,314, "Johnson") in view of Li et al. ("Combining Front Propagation with Shape Knowledge for Accurate Curvilinear Modeling", "Li"). Applicant respectfully traverses the rejection. The Office Action has not established a proper *prima facie* showing of obviousness at least because Johnson and Li, together with the reasoning provided by the Office do not teach or suggest each and every element of these claims.

For example, Applicant cannot find in Johnson or Li or the reasoning provided by the Office any teaching or suggestion of, among other things,

> obtaining segmented 3D tubular structure data by iteratively performing a segmentation that separates the 3D tubular structure data from other data in the 3D imaging data ... and iteratively correcting the initial centerline path using the segmented 3D tubular structure data while the segmentation is iteratively performed,

as similarly recited in claims 1 and 11 and incorporated into claims 2-10.

The Office concedes that Johnson fails to teach correcting the initial centerline path using the segmented 3D tubular structure data,[2] but states that this is accomplished in the curvilinear model of Li using the deformable tubular model.[3]

---

[2] Office Action, pg. 4.

However, Li states that its method constructs a propagation map using FMM and generates an Minimum Cost Path when the end is reached.[4] The deformable tubular model is later constructed.[5] Thus, Li constructs the MCP after the end of the path reached and therefore actually teaches away from "iteratively correcting the initial centerline path using the segmented 3D tubular structure data while the segmentation is iteratively performed," as recited in claim 1.

Additionally, Applicant cannot find in Johnson or Li or the reasoning provided by the Office any teaching or suggestion of

> reinitializing the at least one parameter between iterations of the segmentation algorithm … to accommodate a local variation in the 3D tubular structure data,

as recited in claims 12 and 21, and incorporated into claims 13-20.

Johnson teaches away from automatic methods for Colon Midline Delineation, and instead favors semiautomatic methods.[6] Li states that a distance field is first constructed and then uniformly thresholded to obtain suitable propagation channels.[7] A propagation map is then constructed from a start point using FMM and then backtracked when the end is reached to generate the Minimum Cost Path.[8] Thus, Li does not teach or suggest "reinitializing the at least one parameter between iterations of the segmentation algorithm" as recited in claim 1, but instead determines a distance map first; before using FMM to generate a propagation map.

Therefore, Johnson and Li, either separately or together and with the reasoning provided by the Office does not teach or suggest each and every element of these claims. Accordingly, Applicant respectfully requests withdrawal of the rejection and allowance of claims 1-21.

---

[3] Office Action, pg. 5.
[4] Li, pg. 68, Sect. 3 lines 4-7.
[5] Li, pg. 68, Sect. 3 lines 8-11.
[6] Johnson, col. 11 line 28 through col. 12 line 7.
[7] Li, pg. 68, Sect. 3 lines 4-5.
[8] Li, pg. 68, Sect. 3 lines 5-7.

AMENDMENT AND RESPONSE UNDER 37 C.F.R § 1.111   Page 10
Serial Number:10/723,445   Dkt: 543.011US1
Filing Date: November 26, 2003
Title: SYSTEM AND METHODS FOR SEGMENTING AND DISPLAYING TUBULAR VESSELS IN VOLUMETRIC IMAGING DATA

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 373-6951 to facilitate prosecution of this application.

If necessary, please charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

Respectfully submitted,

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 373-6951

Date _March 10, 2009_   By _Paul J. Urbanski_

Paul J. Urbanski
Reg. No. 58,351

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on March 10, 2009.

John D. Gustav-Wrathall
Name   Paralegal
Schwegman, Lundberg & Woessner

Signature